

A REVISION OF THE GENUS  
*HORRIDIPAMERA* MALIPATIL (HEMIPTERA: LYGAEIDAE)

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*Abstract.*—The genus *Horridipamera* Malipatil is revised. Two new species *H. medleri* from West Africa and *H. compacta* from South India are described. A key to species, a cladogram, and discussion of phylogenetic relationships are included. All species are diagnosed. Extensive distributional data are included. A dorsal view drawing of *H. medleri* and 33 drawings with details of genitalia are given. There is a discussion of the relationships of *Horridipamera* to other genera.

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The genus *Horridipamera* was erected by Malipatil (1978) for three species from Australia and the Orient. The erection of the genus was part of an effort on Malipatil's part to recognize and segregate monophyletic units from the old omnibus genus *Pachybrachius* Hahn. He selected the widespread *Plociomerus nietneri* Dohrn as type species and included two new species (*robusta*—eastern Australia, New Zealand and *cantrelli*—Queensland).

Harrington (1980) included eight additional species, several of which are African. The genus is thus represented throughout the tropics and subtropics of the Eastern Hemisphere.

Several of the species are extremely common, almost ubiquitous in tropical areas yet there is no modern work available to enable a student to readily identify species, nor is there a discussion of the intra-generic relationships.

We accept, for the present, Harrington's conclusion that *Horridipamera* is a monophyletic group although her statement that the broad base of the right conjunctival spine is a synapomorphy that distinguishes *Horridipamera* from *Paraparomius*, *Togo* and *Eucosmetus* is not true for some of the species that she places in the genus although it is true of *nietneri*, the type species.

Harrington (1980) erected the genus *Stalaria* with *Pamera ferruginosa* Stål as type species. She included *Pachybrachius kisseis* Linnavuori and *Pachybrachius nysias* Linnavuori in *Stalaria*. We have examined the lectotype of Stål's *Pamera ferruginosa* from the Stockholm Museum. It is not the species considered to be *ferruginosus* by Harrington. It is a species of *Horridipamera* closely related to *H. pullata* (Hesse) (see species discussion.) *Stalaria* is thus based upon a misidentified type species. The International Rules (Article 70a) state that such cases are to be referred to the commission asking either that the nominal species be designated as the type species or that the species named by the designator be selected. In the present case the specimens believed by Harrington to be *ferruginosus* are conspecific with *Pachybrachius kisseis* Linnavuori. To avoid adding an additional name to the literature (since placing

*Stalaria* as a junior synonym of *Horridipamera* would leave *kisseis* and *nysias* without a generic name) we are revising *Stalaria* and will be asking the commission to set aside *Pamera ferruginosa* as the type species of *Stalaria* and replacing it with *Pachybrachius kisseis* Linnavuori. The status of *Stalaria* thus will at that time become *sub judice* and it should be used in the sense of *kisseis* Linnavuori at least until the commission has acted.

**Diagnosis.** *Horridipamera* can be recognized on the basis of the following characteristics. Generally black and white or brown and white; phallic type II (see Harrington, 1980); anterior pronotal lobe somewhat globose, essentially impunctate; a deeply impressed line separating anterior pronotal collar from remainder of anterior lobe; male fore tibia usually spined; head slightly prolonged behind eyes; phallus lacking appendages or outgrowths except for one pair of conjunctival spines and two vesical marginal processes.

Harrington's cladogram separates *Horridipamera* and *Paraparomius* from such genera as *Togo*, *Eucosmetus* and *Paraeucomstus* on the most tenuous synapomorphies. The latter are "held together" in a clade by having the head broader than the transverse pronotal impression. However, several species of *Horridipamera* have this condition. We believe that the species we have included in *Horridipamera* do, on the basis of their derived phallic features (lack of appendages or outgrowths on phallus other than a pair of conjunctival spines and two vesical marginal processes), form a monophyletic unit. We suggest that all members of the genera noted above need investigation to see if some may also be a part of this clade.

The abbreviations used for collectors are as follows: SS = J. and S. Slater; SSS = J. and S. Slater, Schuh; SSSS = J. and S. Slater, Schuh, Sweet; BAC = Brink, Anderson, Cederholm; HDKB = Hevel, Dietz, Karunaratne, Balasooriya; CDHHS = Cederholm, Danielsson, Hammarstedt, Hedqvist, Samuelsson. Locality: K.N.P. = Kruger National Park.

All measurements are in millimeters.

#### PHYLOGENETIC RELATIONSHIPS

We consider the following conditions to be derived in *Horridipamera*.

1. Asymmetrical conjunctival spines.
2. Bifid left conjunctival spine.
3. T-shaped outgrowth near proximal end of seminal duct.
4. Separation of distal and proximal vesical processes.
5. Loss of serrations on distal vesical processes.
6. Reduction of proximal vesical process.
7. Possession of long hairs on the dorsal surface.
8. Loss of spine near middle of male fore tibiae.
9. Elongation of the legs.
10. Narrow body shape.
11. Strongly produced eyes.
12. Strongly swollen anterior pronotal lobe.
13. Striped scutellum.
14. Possession of four evenly spaced spines near distal end of male fore tibia.
15. Apical vesical process saw-shaped.

16. Proximal portion of proximal vesical process broadened and plate-like.
17. Loss of distal vesical process.

In the cladogram (Fig. 1) we have relied heavily upon features of the phallus. Unfortunately many of what appear to be synapomorphies are reduction phenomena. Most of the reduction and loss is in the vesical processes. Where reduction and loss occur, the remaining portions of the vesical processes have a very similar appearance which we consider unlikely to have been the case if these reductions were homoplasies. Where the apical vesical process is completely lost homoplasy is as likely as synapomorphy.

Species of *Horridipamera* belong to Harrington's (1980) "genitalia type II." In this clade the plesiomorphic condition of the vesical processes is one in which there was a continuous tape-like sclerotization of the vesicular membrane (Figs. 10, 12, 13). A polarity sequence appears to be present in the following manner. First, separation of the tape-like vesicular sclerotization into two separate, but still elongate and twisted, processes (and subsequently into three as in species of *Pseudopachybrachius*). The next stage in the sequence, that is observable in *Horridipamera* at least, is the reduction of the distal process into a slender non-serrated strip (Fig. 8) and the subsequent complete loss of the distal process. The proximal process becomes reduced to form first an elongate slender twisted structure, then is reduced to a short somewhat "C-shaped" but still serrate-margined condition (Fig. 9).

Our other derived conditions are based largely on out-group comparison and include such features as the long hairs on the dorsal body surface, loss of the male fore tibial spines, striped scutellum, etc.

The more difficult areas to separate homoplasies from synapomorphies are in the elongation and narrowing of the body, elongation of the legs, increase in the size and globosity of the anterior pronotal lobe, and shape of the head. It is reasonably clear from out-group comparison that these are derived features but again and again in the Myodochini one sees a tendency to develop degrees of ant mimicry with which the above features are frequently associated. Thus in the cladogram we have used these chiefly as autapomorphies.

#### KEY TO SPECIES OF *Horridipamera*

1. Male fore tibia lacking a distinct median spine ..... 2
- 1a. Male fore tibia with one or more conspicuous spines present midway along shaft or on distal half ..... 3
2. No erect long hairs present on pronotum and scutellum; explanate lateral area of corium uniformly pale except for dark apex; antennal segments I, II, and III black or very dark castaneous; head width as great as or greater than width of anterior pronotal lobe; body relatively slender (Ceylon) ..... *emersoni*
- 2a. Pronotum and scutellum with numerous conspicuous long, erect hairs present; explanate corial margin with a dark spot that reaches lateral margin at level just caudad of end of claval commissure; antennal segments I, II, and III chiefly pale yellow, only distal ends of segments II and III dark; width of anterior pronotal lobe greater than width of head across eyes; body comparatively stout (S. India) ..... *compacta*
3. Male fore tibia with 3-4 small equidistantly placed spines on distal 1/2 ..... *cantrelli*
- 3a. Male fore tibia armed near middle with 1 or 2 large spines ..... 4
4. Hemelytra pilose, with long and erect hairs (view laterally) ..... 5

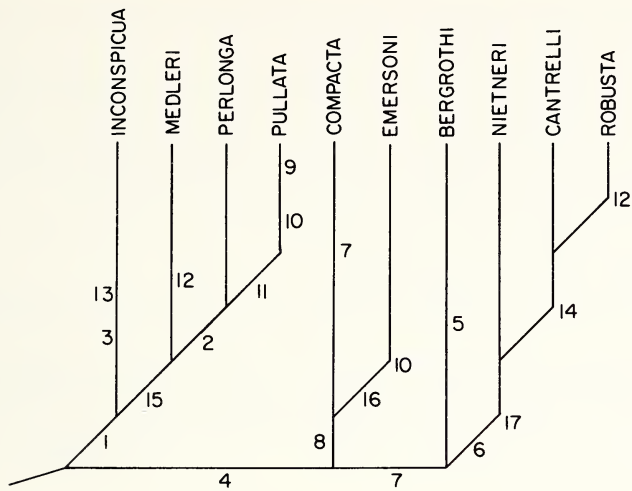


Fig. 1. Cladogram of species of *Horridipamera*.

- 4a. Hemelytra not pilose, without conspicuous long and erect hairs (but sometimes with elongate hairs present on pronotum and scutellum) ..... 7
- 5. Anterior lobe of pronotum huge, in males at least twice as long as posterior lobe; fourth antennal segment with a pale basal annulus (Australia) ..... *robusta*
- 5a. Anterior lobe of pronotum smaller, in males less than twice as long as posterior lobe; fourth antennal segment with or without a pale basal annulus ..... 6
- 6. Hairs on antennal segments II and III twice as long as diameter of segments; decumbent hairs on hemelytra slender, silky not flattened nor somewhat scale-like; anterior lobe of pronotum more swollen and globular frequently higher than posterior lobe; fourth antennal segment uniformly dark; vesica with a reduced ridge-like distal process and an elongate proximal process fading gradually at one end (Figs. 5, 8) (Africa) ..... *bergrothi*
- 6a. Hairs on antennal segments II and III shorter, subequal to diameter of segment; decumbent sericeous hairs on hemelytra shorter and broader, somewhat scale-like; anterior lobe of pronotum relatively narrow, rarely higher than posterior lobe; fourth antennal segment often with a pale basal annulus; vesica only with proximal process, this semi-oval, flap-like, margin inconspicuously toothed (Fig. 9) (Oriental and Australian) ..... *nietneri*
- 7. Scutellum with a pair of oblique brown stripes. A somewhat angulate sclerotized outgrowth present on proximal part of ejaculatory duct (Fig. 7); punctures on pale macula before dark apex of corium dark, of same color as other punctures on corium (Asia and Africa) ..... *inconspicua*
- 7a. Scutellum uniformly black or chocolate brown; ejaculatory duct without a distinct outgrowth proximally; punctures on pale corial macula either pale or dark ..... 8
- 8. Fourth antennal segment with a conspicuous pale basal annulus ..... *perlonga*
- 8a. Fourth antennal segment uniformly dark ..... 9
- 9. Body relatively broad and stout, total body length less than four times width of pronotum across humeral angles; eyes not strongly protruding; width of head across eyes not greater than maximum width across anterior pronotal lobe; middle and hind



- femora darkened only on distal  $\frac{1}{3}$  to  $\frac{1}{2}$ ; hind tibiae largely pale, infuscated only near proximal and occasionally extreme distal ends ..... *perlonga*
- 9a. Body more elongate, total body length at least four times as great as width across pronotal humeral angles; eyes more prominently produced, width across eyes sometime greater than maximum width across anterior pronotal lobe, if not anterior pronotal lobe strongly swollen (*medleri*); degree of dark coloration on hind femora variable; hind femora usually entirely dark, occasionally only darkened on proximal  $\frac{1}{2}$  to  $\frac{2}{3}$ ; hind tibiae usually infuscated (dark brown) for entire length ..... 10
10. Width across eyes less than, or subequal to, maximum width across anterior pronotal lobe; latter strongly swollen and appearing globose; ground color of hemelytra pale with infuscated dark stripes and dashes ..... *medleri*
- 10a. Width across eyes greater than maximum width across anterior pronotal lobe; anterior pronotal lobe relatively slender and linear, not appearing globose; ground color of hemelytra dark brown with a strongly contrasting white subapical corial macula ... 11
11. Head, pronotum, and scutellum chocolate or very dark red brown; white subapical corial macula strongly contrasting with ground color of corium ..... *pullata*
- 11a. Head, pronotum, and scutellum light reddish; subapical corial macula only weakly differentiated from ground color of corium ..... *ferruginosa*

*Horridipamera inconspicua* (Dallas)

*Rhyparochromus inconspicuus* Dallas, 1852, p. 547.

*Diplonotus rusticus* Scott, 1874, pp. 430–431. **New Synonymy.**

*Pamera spinicrus* Reuter, 1882, pp. 17–18. **New Synonymy.**

*Pamera ebenau* Reuter, 1887, pp. 96–97. **New Synonymy.**

*Pachybrachius inconspicuus* Slater, 1964a, p. 1127.

*Horridipamera inconspicuus* Slater, 1979, p. 22.

**Diagnosis.** Body relatively short and stout. Scutellum dark red-brown with a conspicuous pair of light orange to light reddish brown oblique streaks on basal half. Hemelytra chiefly pale yellow with punctures dark brown. Pale macula at inner corial angle large, very conspicuous by virtue of dark streaks extending anteriorly and posteriorly from the pale macula. Usually a dark apical corial macula and a small dark spot at edge of explanate lateral margin (but not reaching margin) at level of inner pale corial macula. Thus corium appearing largely pale and subapical pale macula not strikingly differentiated. Pronotum reddish brown with humeral angles, and often extreme posterior margin, pale yellow. Fore femora dark reddish brown, with pale distal ends. Usually middle femora pale and hind femora with a narrow subdistal dark macula. Antennae variable in color, segments II and III usually pale yellow; segment IV dark sometimes with a pale subbasal annulus present. Second labial segment white or pale yellow. Membrane pale with irregular darker spots and streaks scattered throughout.

Male fore tibiae each with a distinct spine midway along shaft. Dorsal surface lacking numerous elongate upstanding hairs but with decumbent sericeous pubescence. Width of anterior pronotal lobe slightly greater than width of head across eyes and conspicuously swollen. Labium reaching at least to middle of mesosternum.

Sperm reservoir with wedge-shaped bulb, very broad proximally, tapered distally; wings strongly bent ventrad and produced into a narrow elongate blunt projection (Fig. 7). Vesical process of phallus interconnected, elongate, complexly twisted, evenly

serrated (Fig. 13). Conjunctival spines as in Figures 28, 29. Paramere with elongate acute inner projection, inner margin proximal of projection produced into a broad flap-like flange, outer projection short, broad, blade thick (Fig. 35). Ejaculatory duct with a peculiar bent, sclerotized projecting outgrowth near proximal end (Fig. 7).

As might be expected in a species with such a wide range there is considerable variation in color. The scutellar streaks while usually diagnostic may be much reduced in dark specimens and in unusually pale specimens may not be appreciably differentiated from the color of the remainder of the scutellar surface. However, the combination of pale corium in which the distal light macula is little differentiated, relatively pale membrane, stout body, etc., make this a generally readily recognizable species without recourse to the definitive differentiating characters of the male genitalia.

The correct name to apply to this species has been a matter of difficulty. We (Zheng and Slater, 1984) have selected a specimen of this species from West Africa as the neotype of *Rhyparochromus inconspicuus* Dallas (see discussion in that paper) which is the oldest available name.

*First instar nymph.* South Africa: Pretoria, Transvaal, 18.XII.1967 (SSS). (Reared from eggs laid by identified female.) Head and pronotum dull orange. Meso- and metanota gray with reddish borders. Abdomen dull orange red shading to red posteriorly along intersegmental sutures and laterally. Sclerotized areas about scent gland orifices on terga 3-4, 4-5, 5-6 gray with larger pigmented area posterior to suture than anterior to it. Legs uniformly dull white. Antennal segments I, II, III white tinged with reddish. Fourth segment a strongly contrasting orange-red. Length head 0.37, width 0.34, interocular space 0.24. Length pronotum 0.15, width 0.34. Length mesonotum 0.10, width 0.37. Length metanotum 0.07, width 0.39. Length abdomen 0.61. Length labium 0.73, slightly exceeding posterior margin of metacoxae. Length antennal segments I 0.10, II 0.17, III 0.17, IV 0.32. Total body length 1.20.

*Second instar nymph.* (As above.) Head and anterior  $\frac{1}{3}$  of pronotum dark brown. Ground color of remainder of body dull yellow with a narrow dull brown longitudinal stripe on either side of midline and an oblique irregular streak extending dorso-laterad near middle of segment on each side.

Abdominal terga 1, 2 and anterior  $\frac{1}{2}$  of 3 dull gray brown. Remainder of abdomen with dark central markings similar to those of instar 5. Abdomen with red striping along intersegmental sutures. Dark sclerotized areas about scent gland orifices as well developed anterior to orifices as posterior to them; sclerotization between terga 3-4 somewhat wider than that between terga 4-5 or 5-6. Femora conspicuously tinged with red on distal halves. Antennal segment I and proximal  $\frac{1}{2}$  of II white, former with a narrow, dark, basal annulus. Distal  $\frac{1}{2}$  of antennal segment II and all of segments III and IV red.

Length head 0.51, width 0.49, interocular space 0.29. Length pronotum 0.24, width 0.49. Length mesonotum 0.17, width 0.54. Length metanotum 0.10, width 0.63. Length abdomen 0.98. Length labium 0.98, reaching well between metacoxae. Length antennal segments I 0.15, II 0.24, III 0.22, IV 0.43. Total body length 1.95.

*Fifth instar nymph.* South Africa: 17 mi NE Pretoria, Pienaars River Dam 1.XI.1967 (SSS). General coloration bright tan, or light brown interspersed with light yellow as follows: a longitudinal stripe running completely through pronotum on either side of midline and a short longitudinal vitta on posterior pronotal lobe slightly mesad

of humeral angles; a series of oblique stripes on scutellum and mesothoracic wing pads giving a striped appearance to these areas; distal ends of femora, tibiae, first tarsal segments and second and third antennal segments pale yellow.

Color of abdomen complexly variegated: ground color pale yellow, an elliptical brown macula present around dorsal scent gland openings between terga 3-4, 4-5 and 5-6, that between 3-4 broader than succeeding. Tergum 2 dark brown; tergum 3 mesally chiefly brown but this coloration extending posteriorly to scent gland macula only as a pair of narrow bars and a mesal convex extension from the main darkened central area; tergum 4 with an ovoid central dark patch, enclosed on either side by a pincer-like dark band that coalesces posteriorly with macula surrounding terga 4-5 scent gland orifices; terga 5, 6 and 7 each with a dark central macula, that on tergum 5 especially large. Oblique dark rays extending cephalo-laterad from dark central areas of each segment, sutures between segments also dark. Explanate lateral margins of pronotum and wing pads pale yellow with narrow dark brown outer edges. First antennal segment pale yellow with a strongly contrasting dark brown basal annulus. Fourth antennal segment uniformly reddish brown. Femora and second tarsal segment dull brown.

Head slightly declivent. Tylus attaining middle of first antennal segment. Vertex moderately convex. Epicranial suture with stem present but very short. Length head 0.81, width 0.90, interocular space 0.56. Lateral pronotal margins narrowing evenly but moderately from humeral angles to anterior margin; both anterior collar and transverse impression conspicuous. Anterior pronotal lobe much larger and more convex than posterior. Length pronotum 0.79 (length anterior pronotal lobe 0.59, length posterior pronotal lobe 0.20), width pronotum 1.07. Mesothoracic wing pads broad, reaching to or almost to suture between abdominal terga 3-4. Length mesothoracic wing pads 1.10. Length abdomen 1.76. Fore femur generally with 2 or 3 spines on inner rank and a single spine on outer. Labium extending posteriorly to or between mesocoxae. Length labial segments I 0.29, II 0.37, III 0.56, IV 0.59. Length antennal segments I 0.32, II 0.73, III 0.61, IV 0.88. Total body length 4.07.

We have examined 3rd and 4th instar nymphs from Meintjies Kop, Pretoria, South Africa 19.III.1968 (SSS). These closely resemble instar 5 in color.

*Biology.* This species is abundant in early succession stages of old fields in South Africa. It is one of the most common of the lygaeid species that comes to lights in Pretoria where it presumably lives in gardens and weed grown lots. We were unable to establish any definite breeding host, but on several occasions took adults and nymphs along roadsides below a variety of weeds and grasses. It apparently is not entirely, if at all, a grass feeder, since it often occurs on recently burned over veld with much bare ground and where only scattered forbs produce a seed crop.

*Distribution.* *H. inconspicua* is distributed throughout much of the Ethiopian Region, occurs on at least some of the islands of the Indian Ocean and through the Oriental Region to China and Japan.

It is considerably less common than *perlonga* in West Africa. By contrast *inconspicua* is an abundant, almost ubiquitous, species in South Africa. The distributions of *inconspicua* and *perlonga* in fact closely resemble those of *Pseudopachybrachius reductus* (Walker) and *P. capicola* (Stål) where the former is abundant in West Africa, but scarce in South Africa and *capicola* the reverse. Cases like these suggest former allopatry for these disturbed habitat or early succession stage insects. If so the sub-



sequent sympatry is possibly due to disturbance by man that has led to the elimination of former ecological barriers.

*H. inconspicua* has previously been reported from: Senegal (Slater and Wilcox, 1973) and (Scudder, 1982—as *spinicrus* and *ebenau*); Sierra Leone (Dallas, 1852); “Guinea” (Lethierry and Severin, 1894—as *spinicrus*); Ghana (Reuter, 1882—as *spinicrus*); Ruanda (Schouteden, 1957); Zaire (Slater, 1972); Sudan (Linnavuori, 1978—as *spinicrus*); Tanzania (Scudder, 1962a); Southwest Africa (Schumacher, 1913—as *ebenau*?); Cape Verde Is. (Lindberg, 1958—as *ebenau*); South Africa (Slater, 1964b); Madagascar (Reuter, 1887—as *ebenau*); Rodriguez I. (China, 1924—as *ebenau*); Sri Lanka (Slater, 1979); Japan (Scott, 1874—as *rusticus*); China (Horvath, 1879—as *nietneri*).

*Additional material examined.* SENEGAL: 4, off Senegal at sea, 25.x.1957 (Capener). 1, Guede, 1.iii.1946 (Risbec). GUINEA: 9, off coast, xii.1957 (Capener). GHANA: 1, Accra, 14.xi.1969 (Campbell). NIGERIA: 2, Ile-Ife, xi.1969 (Medler). 5, same, 27.iii.1969. 18, same, 10.iii.1969. 1, same, 25.iii.1969. 1, Keffi, B.P. State, 23.xii.1968 (Medler). 7, Bedeggi, NW State, 14.xii.1974 (Medler). 1, Lagos, Univ. Campus, ii.1975 (Hamid). ST. THOMAS IS.: 1, Neves, Cote N 25 km S Tome, 21.x.1973 (Schmitz). CAPE VERDE IS.: 3, Tiago, Sierra Pico Antonia, 10.ii.1945 (Panelius). SUDAN: 2, Blue Nile, Wadi Medari, 11–12.xi.1962 (Linnavuori). 2, Upper Nile, Malakal, 5–20.i.1963 (Linnavuori). TANZANIA: 2, Mlingano, 5.xi.1963 (Robertson). 1, same, 13.vi.1963. 2, Ukiriguru, 8.xi.1960 (Robertson). 1, same, 29.iv.1960. 1, Ilonga, 29.ix.1963 (Robertson). 2, same, 3.x.1963. 7, Tabora, 27.xi.1963 (Robertson). 2, same, 28.xii.1963. 1, same, 1.i.1964. BOTSWANA: 2, 2 mi N Gaberones, 21.x.1974 (Samuel Slater). SOUTH AFRICA: *Transvaal*: 1, 20 mi SW Rustenburg, 20.x.1974 (Samuel Slater). 1, Rustenburg, 4.xii.1950 (Capener). 2, same, 4.xii.1951. 3, 10 mi N turnoff, 19 mi E Groot Marico, 22.x.1974 (Samuel Slater). 18, Pretoria, 22.x.1967 (SSS). 79, same, 23.x.1967. 2, same, 27.x.1967. 21, same, 2.xi.1967. 2, same, 3.xi.1967. 2, same, 5.xi.1967. 1, same, 6.xi.1967. 1, same, 7.xi.1967. 1, same, 22.xi.1967. 1, same, 24.xi.1967. 3, same, 25.xi.1967. 6, same, 27.xi.1967. 3, same, xi.1967. 1, same, 4.xii.1967. 9, same, 5.xii.1967. 6, same, 9.xii.1967. 3, same, 3.i.1968. 2, Nat. Botanical Garden, 24.xi.1967 (SSS). 3, Fountains, 28.x.1968 (SSS). 2, Irene, Smut's Farm, 10.i.1968 (SSSS). 6, Meintjies Kop, Pretoria, 22.x.1967 (SSS). 1, same, 18.iii.1968. 1, same, 19.iii.1968. 1, same, 29.x.1967. 1, Lyttleton, 26.xii.1967 (SS). 1, same, 17.xii.1967. 2, same, 18.xii.1967. 1, same, 12.i.1968. 1, same, 19.i.1968. 1, same, 26.ii.1968. 2, same, 29.ii.1968. 1, same, 20.xi.1968. 1, 10 mi N Mookeetsi, 13.xii.1967 (SSS). 1, Dendron, xi.197—(van Ark). 5, Hartebeesport Dam, 20 mi W Pretoria, 30.x.1967 (SSS). 1, 14 mi NE Potgietersrus, 26.x.1967 (SSS). 3, Mariepskop nr. Klaserie, 6,300 ft, 30.xi.1967 (SSS). 1, 10 mi SSW Skukuza (K.N.P.), 26.iv.1968 (SSSS). 1, 10 mi N Satara Camp (K.N.P.), 28.iv.1968 (SSSS). 1, 3 mi E Satara Camp, Nwanedzi River (K.N.P.), 29.iv.1968 (SSSS). 2, 9 mi N Pietersburg, 26.x.1967 (SSS). 9, 15 mi SSW Pietersburg, 25.x.1967 (SSS). 1, Pietersburg, 26.x.1967 (SSS). 6, base Magoebaskop 4,000 ft, 12.xii.1967 (SSS, Munting). 1, 6 mi N Warmbaths, 7.xii.1967 (SSS). 1, Zoutpansberg, 4,500 ft, 5 mi N Louis Trichardt, 8.v.1968 (SSSS). *Cape Province*: 1, Van Zylsrust, Kuruman River, 2.xi.1967 (Coaton). 6, Kimberley, 17–18.i.1968 (SSSS). 2, 31 mi NE Calvinia, 10.x.1974 (S. Slater & Ecker). *Orange Free State*: 10 mi Petrus Steyn to Reitz, 27.xii.1967 (SSS). 1, Lindly, xii.1951 (Weber). *Natal*: 10 mi W Paulpietersberg, 7.xi.1967 (SSS). CEYLON: 2, Anu. Dist. Wildlife



Bungalow, Hunuwilagama, Wipattu, 200 ft, 10–19.iii.1970 (Davis and Rowe). 1, Kan. Dist. 5 mi NW Maheyangana, 30.iii–1.v.1971 (Spangler). 2, Tri. Dist., China Bay, 200 ft, 9–11.ix.1976 (HDKB). INDIA: 1, Pulney Hills, Kodiakanal, 6,500 ft, v.1953 (Nathan). PHILIPPINES: 1, Mt. Maquiling, Luzon, 15.xi.1947 (Gines). JAPAN: 2, Nishinomiya, P.R. Settsu, 27.xi.1952 (Nakanishi).

We have dissected specimens from South Africa, Nigeria, Tanzania, Japan and Ceylon. No significant differences have been found.

*Horridipamera cantrelli* Malipatil

*Horridipamera cantrelli* Malipatil, 1978a, pp. 94–96.

*Diagnosis.* It is readily distinguishable from all species of *Horridipamera* except *robusta* by the presence of four small equidistantly spaced spines on the distal half of each male fore tibia.

*H. cantrelli* is closely related to *nietneri* as is indicated by the lack of the distal vesical process and the reduction of the proximal process, the quadrate sperm reservoir wings that only curve moderately posteriorly and the similarly shaped parameres.

*H. cantrelli* has a pale basal annulus on the fourth antennal segment, pale pronotal humeri, spotted fore femora and chiefly pale hemelytra. The coloration of the hemelytra is very similar to that of *inconspicua*. The known specimens range in length from 5.5 to 6.2 mm.

Malipatil's (1978) description and figures are excellent. The spotted fore femora lack of a greatly swollen anterior pronotal lobe and the characteristic fore tibial (male) spines should enable the species to be readily recognized.

*Distribution.* AUSTRALIA: Known only from the type localities in Queensland.

*Horridipamera perlonga* (Scudder)

*Pachybrachius pullatus* Slater, 1964b (*nec* Hesse), p. 217.

*Pachybrachius perlongus* Scudder, 1969, p. 173.

*Horridipamera perlongus* Harrington, 1980, p. 99.

*Diagnosis.* Elongate, slender. Head, pronotum and scutellum piceous to reddish brown. Scutellum uniformly dark, lacking oblique reddish brown stripes. Anterior pronotal lobe impunctate. Clavus and corium lacking upright hairs. Fore femora except proximal and distal ends chocolate brown. Middle and hind femora pale yellow with a broad subdistal dark annulus. Antennal color variable from nearly uniformly dark to chiefly pale yellow on segments I, II, and III. Fourth antennal segment frequently with a yellow basal annulus. Males with a spine present near middle of each anterior tibia. Hemelytra usually with a conspicuous subdistal white corial macula, lateral explanate corial margin pale. Labium at least attaining middle of mesosternum, first segment remote from base of head, second segment usually white or pale yellow. Membrane usually dark with veins white and with a narrow white apical median stripe.

Sperm reservoir bulb wedge-shaped similar to that of *inconspicua* but slightly less narrowed distally. Wings strongly bent downward but evenly narrowed (Fig. 6) not produced into an elongate narrow projection. Vesical processes of phallus more or

less connected, complexly twisted, proximal process saw-like (Fig. 10). Left conjunctival spine broad and blade-like throughout most of length, slightly bifid and terminating in an acute spine at distal end (Fig. 20). Right conjunctival spine evenly tapering (Fig. 21). Paramere with expanded margin proximad of acute inner projection subtruncate with proximal margin concave (Fig. 32).

*H. perlonga* is a variable species. The fourth antennal segment usually has a pale proximal annulus, but many specimens, from West Africa particularly, have the fourth segment entirely dark. The head, pronotum, and scutellum are always dark (though varying from almost black to reddish brown) whereas the hemelytra are variable in color. In some specimens the clavus and corium are almost completely pale with only the large apical corial macula, an area at the inner corial angle and some of the punctures retaining the dark brown coloration. More commonly the corium has a broad irregular dark transverse fascia (frequently incomplete), a dark patch near the base and the clavus strongly infuscated with brown so that only the proximal  $\frac{1}{2}$  of the cubital vein, an irregular basal area and small "dash" opposite the claval commissure is pale.

There is, as in many myodochines, considerable variation in the relative length and degree of convexity of the anterior pronotal lobe. The difference in the length of the antennae is remarkable. Thus when one compares an elongate slender, pale specimen with a short robust dark one it is difficult to believe that only a single species is involved. However, all intermediate conditions are present in the study series, and there are no differences in the male genitalia. We conclude that a single species is represented.

*Biology.* This is an uncommon species in South Africa where much of the African field work of the senior author has been concentrated. On May 1, 1968 we took adults and nymphs of *perlonga* under a creeping forb with many seeds present that was growing below a large Natal mahogany tree (*Trichilia emetica* Vahl.). This was a disturbed habitat, much trampled by hippopotami, near Letaba Camp, Kruger National Park, South Africa.

*Fifth instar nymph.* South Africa: Kruger National Park 4 mi E Letaba Camp, Letaba River, 1.V.1968 (SSSS). Very unlike *inconspicua* in general coloration. Head and pronotum dark chocolate brown, the latter nearly unicolorous, lacking any indication of pale longitudinal stripes near midline; scutellum and wing pads dark the latter very obscurely marked; a pair of faint diagonal paler streaks on scutellum and a small pale yellow macula anteriorly near lateral margin of each wing pad and a second adjacent on explanate flange of wing pad. Ground color of abdomen dull red. Dark areas in central portion of terga 3–7 similar to *inconspicua* but tending to form a broad median dull brown stripe; tergum 4 mesally with only a spot in center but with a broad dark transverse fascia that covers almost entire tergum laterad of scent gland orifices. All terga darkened laterally. Abdomen below dull reddish with a strongly contrasting pale yellow oblique band on sterna 4 and 5 running anterolaterad from meson of sternum 5. Antennae and femora dull reddish; tibiae brown; first tarsal segment pale yellow, second tarsal segment somewhat infuscated.

Head slightly more formicoid than is that of *inconspicua*. Tylus reaching middle of 1st antennal segment. Stem of epicranial suture relatively elongate. Length head 1.20, width 0.90, interocular space 0.54.

Explanate pronotal margins much less strongly developed than are those of *in-*

*conspicua*. Length pronotum 0.85 (length anterior pronotal lobe 0.66, length posterior pronotal lobe 0.20), width 1.02. Length mesothoracic wing pads 1.36. Length abdomen 2.32. Fore femora with 2–3 spines on inner rank, one spine on outer rank. Labium apparently attaining mesocoxae. Length labial segments I 0.71, II 0.68, III 0.49, IV 0.37. Length antennal segments I 0.43, II 0.90, III 0.78, IV 0.90. Total body length 5.18.

The nymphs of *H. perlonga* and *H. inconspicua* are extremely different in appearance. *H. perlonga* has a much more ant-like facies with its dark coloration, white banded abdominal venter and long head and legs. *H. inconspicua* on the other hand gives no suggestion of ant mimicry and the general appearance is of a pale streaked and striped insect. The median coloration of the abdominal terga is similar but the other striking differences in the nymphs suggest that these two species are not closely related.

*Egg*. South Africa: K.N.P., 4 mi E Letaba Camp, Letaba River, 1.V.1968 (SSSS). Egg elongate elliptical, truncate at anterior end ("typical" rhyarochromine shape); surface lacking numerous hairs. Six short closely set micropylar processes at anterior pole. Length 1.17, maximum width 0.39.

There does not appear to be a significant difference between the eggs of *inconspicua* and *perlonga*.

*Distribution*. *H. perlonga* is a widespread, ubiquitous species in West Africa. It occurs over much of tropical Africa and on Madagascar as well. In South Africa it is known only from the tropical and subtropical areas of the eastern Transvaal and Natal.

*H. perlonga* was originally described from Guinea (Scudder, 1969) and has been subsequently reported from Senegal by Scudder (1971, 1982) and Slater and Wilcox (1972) and from the Sudan by Linnavuori (1978). Slater's (1964b) record of *Pachybrachius pullatus* from Eranchi, Swaziland belongs here as do his (1972) records of "*Pachybrachius* nr. *pullatus*" from Zaire.

*Additional material examined*. SENEGAL: 7, Npaki, 11 km S Ziguichor, 8.xi.1977 (CDHHS). 1, in forest 1 km NE Djibelor about 7.5 km W Ziguichor, 8.xi.1977 (CDHHS). 1, Cap Skiring, 10.xi.1977 (CDHHS). GAMBIA: 2, Tendebe Camp near River Gambia, 14.xi.1977 (CDHHS). 1, River Tanji, 3 km SW Brufut, 28.xi.1977 (CDHHS). 1, outside Abuko Nature Reserve at waterworks, 26.xi.1977 (CDHHS). 1, Abuko Nature Reserve, 18.xi.1977 (CDHHS). 1, 2 km S Kitty, 7 km SSW Brikama Road Junction, 27.xi.1977 (CDHHS). GUINEA: 2, off coast wind NNW, xii.1957 (Capener). GHANA: 181, Tafo, 4–9.x.1967 (SSS). 1, Tafo, 28.xi.1965 (Leston). 1, same, 29.xi.1965. 1, same, 9.xii.1965. 1, same, 17.xii.1965. 1, same, 1.vi.1967. 1, same, 7.viii.1967. 1, Kade, 28.v.1966 (Leston). 2, Goaso, 21.iii.1969 (Leston). 1, Kpandu, 1.xi.1969 (Leston). 1 no abd., Osiem, 24.vii.1967 (Leston). 2, Wiawso W.R., 31.iii.1969 (Leston). 5, Accra, 15.xi.1969 (Campbell). 2, same, 14.xi.1969. 1, same, 22.xi.1969. 2, same, 16.xi.1969. 1, same, 1.xii.1969. 1, Mt. Atewa, 2,000 ft, 6.x.1967 (SSS). NIGERIA: 4, Oban RH, SE State, 7.iv.1975 (Medler). 2, Ile-Ife, 10.iii.1969 (Medler). 4, same, iv.1969. 6, same, 27.iii.1969. 1, same, ix.1974. 1, same, 25.iv.1969. 1, same, 5.v.1969. 2, same, 10.iii.1969. 1, same, xi.1969. 1, same, 27.x.1969. 2, U. Ora, M.W. State, xi.1974 (Medler). 1, Sopoba FR, M.W. State, viii.1973. 9, Umuahia CRIN, EC State, 9.iv.1975 (Medler). 2, Ikom CRIN, SE State, 4.iv.1975 (Medler). 1, Obudu CR, SE State, 27.ix.1973. 6, Udo FR, M.W. State, 11.iv.1975 (Medler).



1, Ibadan, W. State, 15.iii.1969 (Medler). 1 Benin, NIFCR, M.W. State, 1.iv.1975 (Medler). CAMEROON: 1, (Carayon). UGANDA: 1, Lake George, 27.v.1940 (Stephenson). 1, Kawanda, 19.vi.1958 (Odhiambo). 1, Kassesse Busongoro, 20.v.1940 (Stephenson). TANZANIA: 3, Mlingano, 13.vi.1963 (Robertson). 1, same, 29.viii.1963. 1, same, 22.i.1966. 1, Ilonga, 14.iv.1965 (Robertson). 6, same, 8.i.1965. 4, same, 26.ii.1964. 1, same, 18.iv.1965. 4, same, 29.iv.1963. SOUTH AFRICA: Natal: 5, Eshowe, 15.xi.1967 (SSS). 1, St. Lucia Park, Zululand, 26.i.1968 (Brinkman). 1, Lake St. Lucia, Charters Creek, 12.xi.1967 (SSS). Transvaal: 1, Letsitele Valley, Gravelotte District, 18.xi.1958 (Capener). 2, base Magoebaskloof, 4,000 ft, 12.xii.1967 (SSS). MADAGASCAR: 1, E District Maroantsetra, v.19—(J. Vadon). 1, Sambirano, Nossi-Be, Foret de Lokobe, i.1960 (Andria Robinson). 1, Est. Dct. Sambava R. N. xii-Maroejy, Beondroka 1,200 m, vi.1960 (P. Soga). 1, Est. Anka-lampona 130 m, Navana-Marpamtsetra, iii.1958 (Soga-Raharizonina).

*Horridipamera pullata* (Hesse)

*Pamera pullata* Hesse, 1925, p. 79.

*Pachybrachius pullatus* Slater, 1964a, p. 1140 (Pt.).

*Horridipamera pullatus* Harrington, 1980, p. 99.

*Diagnosis.* Very elongate, slender with unusually long legs and antennae. Head, pronotum and scutellum black to dark red-brown. All femora chiefly dark chocolate brown, pale only on proximal  $\frac{1}{3}$  to  $\frac{1}{4}$  and occasionally at extreme distal ends of fore femora. Antennae chocolate brown to reddish brown nearly uniformly colored; fourth segment never with a proximal pale annulus. Scutellum lacking oblique reddish vittae, uniformly dark. Second labial segment not pale, similarly colored to other segments. Hemelytra strongly suffused with chocolate (as in dark specimens of *perlonga*), a large subapical elliptical white corial macula present. Membrane dark with veins narrowly pale and a short apical median pale vitta present.

Eyes prominent, strongly elevated above vertex and produced. Width across eyes noticeably broader than width of anterior pronotal lobe.

Male genital structures very similar to those of *perlonga*. Bulb of sperm reservoir more quadrate, not appreciably narrowing distally. Left conjunctival spine relatively shorter much more deeply bifid at distal end (Fig. 16). Right conjunctival spine is very elongate and sharply acute (Fig. 17). Flange-like area proximad of inner projection of paramere narrow, more elongate and tapered than in *perlonga*.

Although similar to *perlonga* in size, and to darker specimens of the latter in color, *pullata* is a more slender and long legged species with more "uplifted" and protruding eyes. Occasional specimens of *perlonga* may have the head slightly broader than the anterior pronotal lobe and when this condition occurs in specimens with dark fourth antennal segments identification may be difficult without comparative material. We have found two differences in color that appear to be diagnostic. In *pullata* the middle and hind femora are completely dark chocolate brown on the distal  $\frac{2}{3}$  to  $\frac{3}{4}$  and the second labial segment is brown and concolorous with the other labial segments. In *perlonga* the middle and hind femora have only a small subdistal dark annulus and the second labial segment is white or dull yellow. The majority of specimens of *perlonga* may be separated from *pullata* by the pale basal annulus on the fourth antennal segment.



*Distribution.* *H. pullata* has previously been thought to be a South African species. This is not true. Hesse (1925) originally described it from Southwest Africa and Slater (1964b) reported it from Swaziland. Hesse's record was from Ovamboland in northern Southwest Africa and Slater's Swaziland record pertains to *perlonga*. *H. pullata* is a tropical African species. It is sympatric with *perlonga* in West Africa from where most of our study material has come. Scudder (1969) reported it from Guinea. It also occurs in Tanzania and has been reported by Linnavuori (1978) from the Sudan and Chad. Thus it will probably prove to be widespread in tropical Africa. It is appreciably less common than *perlonga* in collections from areas where the two have been taken together. See discussion under *H. ferruginosa*.

*Material examined.* IVORY COAST: 1, Lamto (Toumodi), 17.iii.1964. 1, same, 10.iv.1962. 1, same, 10.iii.1964. 1, same, 4.xii.1962. GHANA: 1, Accra, 1.xii.1969 (G. W. Campbell). 8, Tafo, 7.x.1967 (SSS). 3, same, 8.x.1967; 2, same, 4-9.x.1967. 1, Tafo, 7.vii.1965 (Leston). 1, same, 2.viii.1965. 1, same, 11.x.1965. 1, same, 22.vii.1967. 1, same, 14.x.1967. 1, Salt Pond, 17.ii.1966 (Leston). 1, Kade, 2.ix.1965 (Leston). 2, Obuasi, 7.ii.1966 (Leston). 1, Prestea W.R., 13.ii.1966 (Leston). 1, Legon, 29.viii.1968 (Leston). 1, Osiem, 21.x.1966 (Leston). NIGERIA: 11, Umuahia CRIN, EC State, 9.iv.1975 (Medler). 2, Ikom CRIN, SE State, 4.iv.1975 (Medler). 7, Oban RH, SE State, 7.iv.1975 (Medler). 1, Ile-Ife, 5.v.1969 (Medler). TANZANIA: 1, Mlingano, 5.xi.1963 (Robertson).

#### *Horridipamera ferruginosa* (Stål), New Combination

*Pamera ferruginosa* Stål, 1874, p. 151.

As previously noted Harrington (1980) cited *Pamera ferruginosa* as the type species of her new genus *Stalaria*. Harrington, however, had misidentified *ferruginosa*, confusing it with *Pachybrachius kisseis* Linnavuori. As noted in the generic discussion we are revising "*Stalaria*" and will be appealing to the International Commission to have *ferruginosa* set aside as the type species of *Stalaria* and asking that *P. kisseis* Linnavuori be named the type species.

*P. ferruginosa* Stål is actually a species of *Horridipamera*. Stål (1874) in his original description keyed *ferruginosa* into a couplet with species whose males have a spine midway along the shaft of the tibia. Harrington (1980) notes the lack of such a spine as one of the diagnostic features of *Stalaria*. Harrington's misidentification apparently resulted from her use of specimens in the senior author's collection from Upemba National Park, Zaire. These specimens had been reported by Slater (1972) as "*Pachybrachius* nr. *ferruginosus* (Stål)" with the statement: "The series reported above differs from the type of *ferruginosus* in several important characteristics and probably represents an undescribed species." The specimens are in fact *Stalaria kissei* (Linnavuori) (1978).

The status of *ferruginosa* within *Horridipamera* is a matter of some concern. The lectotype is very closely related to, if not conspecific with, *pullata* Hesse. However, it is light reddish brown, whereas all of the West African specimens that we have examined are chiefly dark chocolate brown. Scudder (1977) when selecting the lectotype noted that it was "slightly teneral." This may well be true. We are reluctant to synonymize the two species when such a striking color difference is present. We

feel that study of a series from Principe Island is needed before formal synonymy is warranted.

The following measurements are from the male lectotype bearing labels as indicated by Scudder (1977). Head length 1.10, width 1.00; interocular space 0.50. Pronotum length 0.78, width 1.28. Scutellar length 0.80, width 0.70. Length claval commissure 0.52. Midline distance apex clavus–apex corium 1.14. Midline distance apex corium–apex membrane 0.90. Length labial segments I 0.64, II 0.74, III 0.44, IV 0.40. Length antennal segments I 0.50, II 1.02, III 0.94, IV 1.10. Total body length 5.36.

*H. ferruginosa* is not included in the preceding cladogram but has all of the derived conditions that pertain to *pullata*.

*Horridipamera nietneri* (Dohrn)

*Plociomerus nietneri* Dohrn, 1860, p. 404.

*Pachybrachius nietneri* Slater, 1964a, p. 1133.

*Horridipamera nietneri* Malipatil, 1978, p. 90.

*Diagnosis.* Very similar in color and structure to *bergrothi* differing chiefly in the much shorter hairs, especially those on the antennae which for the most part are scarcely longer than the diameter of the segment, the more flattened sericeous hemelytral pilosity, the (usually) less globose anterior pronotal lobe and the shorter head.

Bulb of sperm reservoir not strongly tapered distally, but bluntly rounded at distal end. Reservoir wings curving posteriorly, but less extremely so than in *perlonga* and *conspicua*, tapering evenly, blunt at distal ends. No distal vesical process present. Proximal process small, consisting of a crescentic serrated process (Fig. 9) lying on right side of ejaculatory duct immediately distad of right conjunctival spine. Right conjunctival spine much longer than left and expanded into a point distally before acute apical tooth. Both spines terminating in acute apical tooth-like points (Figs. 22, 23). Paramere with blade and prominently produced outer projection short and rounded; inner projection strongly recurved (Fig. 33).

*H. nietneri* and *H. bergrothi* are allopatric and probably derived from a common ancestor. The external differences as well as those of the male genitalia appear to be constant.

Malipatil (1978a) discusses the variability of *nietneri* in detail pointing out that specimens from New Caledonia, New Hebrides, Samoa, and some other Pacific islands are smaller than mainland specimens and that there is considerable variation in the conjunctival spine. This is true of the limited material we have examined from these islands and from Fiji as well. Specimens from these islands also have a very conspicuous white annulus on the fourth antennal segment and relatively short up-right hemelytral hairs.

The color pattern in some of the Pacific island populations is remarkably different from those of the Asiatic mainland. In Pacific specimens the hemelytra tend to be black with broad white or pale yellow lateral margins. A very similar coloration occurs in *emersoni* on Ceylon, *Paraeucosmetus pacificus* Malipatil (Fiji, Western Samoa, New Hebrides, Tonga, Niue) and in eastern Pacific populations of *Pseudopachybrachius guttus* (Dallas). The reason for this apparent color convergence is unknown.

We have accepted the synonymy as given by Malipatil (but have not examined types) except that of *Pamera emersoni* Distant which is a quite different species.

*Fifth instar nymph.* Mt. Coot-Tha, Brisbane, Queensland, Australia 10.I.1972 (J. A. Slater). General shape and color pattern similar to *perlonga* but reddish brown rather than black or chocolate brown on head and pronotum. Median dark areas on abdominal terga as in *perlonga* but much lighter than dark elliptical areas around scent gland orifices. Coloration mesally on tergum 3 projecting posteriorly to sclerotization about scent gland orifices between terga 3-4 suture in the form of three "prongs" as in *inconspicua*.

Malipatil (1978b) has described and figured the 5th instar nymph in detail (from Queensland). Neither his figure nor description shows the small dark spot with a parenthesis-like mark surrounding it which is present mesally on the 4th abdominal tergum.

*Egg.* Described by Malipatil (1978b). Said to have 5 chorionic processes, an average total length of 1.14 and average maximum width of 0.34.

*Distribution.* *H. nietneri* is found almost throughout the Oriental Region. It also occurs in northern and eastern Australia and east into the Pacific Islands at least as far as the Carolines and Samoa. It was originally described from Ceylon. Slater (1964a) lists records from Burma, India, China, Malaya, Cambodia and Thailand on the mainland and from the following islands: Bonins, Carolines, Guam, Christmas, New Caledonia, Fiji, Japan, Ryukyus, Taiwan, Samoa, Celebes, Java, Sumatra, Philippines, Moluccas and Laccadives and Australia. Malipatil (1978a) adds New Guinea, New Hebrides and the Tonga Islands. He gives detailed information on the Australian distribution where it is chiefly confined to Queensland and Northern Territory but he states that it also occurs in New South Wales. Tomokuni (1982) reports it from Minami-Iwojima (San Agustino) Island of the Volcano Islands.

*Additional material examined.* PHILIPPINES: 3, Manila, (Luzon), iv.1947 (Enns). 1, Mt. Maquiling (Luzon), 18.viii.1950. 1, same, 18.i.1947 (Santas). 4, same, 19.ii.1947 (Agbozala). 3, same, 2.xi.1949, 50 ft (Uichanco). 1, same, 10.x.1949 (Hosillos). 1, same, 20.ix.1951 (Bowagan). 1, Manila (domestic airport waiting room), 29.x.1963 (McFarland). 1, IRRI Farm, Luzon, 11.x.1972 (Pawar). 1, same, 8.v.1972. 1, same, v.1972. 1, same, iv.1972. 1, same, iii.1972. 1, same, vi.1972. 2, same, 12.x.1972. 1, same, 23.xii.1972. 2, same, 3.iii.1972. 2, same, x.1972. 1, same, i.1972. 2, same, 7.xi.1972. 1, Sagada (Luzon), Mt. P., 9.iv.1972 (Pawar). 1, Ilagan (Luzon), Isabela, 25.v.1972 (Pawar). 1, Munoz, NE, 23.v.1972 (Pawar). 1, Vigan Island (S. Luzon), 28.v.1972 (Pawar). 1, Ladoy Island (N. Luzon), 27.v.1972 (Pawar). 1, St. Rosa, Laguna, Luzon, 6.iii.1972 (Pawar). 1, Malolos, Buula (Luzon), 12.iv.1972 (Pawar). 1, Apari, Cagayan (Luzon), 26.v.1972 (Pawar). 1, Legaspi, Albay, 16.i.1964 (McFarland). BORNEO: 1, Kota Kinbulu, 29.xii.1967 (Roche). 1, same, 25.xii.1967. OKINAWA (RYUKYUS): 3, Kin, 18.ix.1945 (Slater). 1, same, 7.ix.1945. 1, same, 14.vii.1945. INDIA: 5, Anamalai Hills, Cinchona, 3,500 ft, iv.1959 (Nathan). 2, same, v.1959. 1, Coimbatore, x.1951 (Nathan). 4, same, x.1953. 1, same, xi.1964. 1, same, 22.xii.1951. 1, same, ix.1951. 1, Orissa, C.E. India, Jeypore, 1,775 ft, x.1958 (Nathan). 1, Kurumbagarum, Karikal Territory, viii.1955 (Nathan). 1, same, xi.1951. 1, Nilgiri Hills, Sinpare, 3,400 ft, v.1954 (Nathan). SRI LANKA: 2, N. Centr. Prov., Polonnaruwa, 10.ii.1962 (BAC). 2, N. Centr. Prov., Kandurukanda, 20 mi NE Habarana, 8.ii.1962 (BAC). 4, Anu. Dist., Wildlife Soc. Bungalow, Hunuwilagama,



Wilpattu, 10–19.iii.1970 (Davis, Rowe). 2, “Rat. Dist.,” Uggalkaltota 350 ft, Irrigation Bungalow, 31.i–8.ii.1970 (Davis, Rowe). 1, Kandy District, 5 mi NW Mahiyangana, 30.iii–9.iv.1971 (Spangler). 1, “Ham. Dist.,” Wirawila Wewa, 85 ft, 26.x.1970 (Flint). 2, “Kal. Dist.,” Agalawatta, 13–14.x.1976 (HDKB). NEW CALLEDONIA: 6, Yate (under tall grasses), 9.vii.1977 (Alex Slater). FIJI: 1, Viti Levu, Nadarivatu, 31.i.1968 (Gross). 2, Nausori Highlands 16 mi E Nandi, 16.vii.1977 (Alex Slater). 2, same, 20 mi E Nandi. NEW HEBRIDES: 3, Efate Isl., Port Villa, 10–13.vii.1977 (Alex Slater).

*Horridipamera bergrothi* (Horvath)

*Pamera bergrothi* Horvath, 1892, p. 261.

*Pachybrachius bergrothi* Slater, 1964a, p. 1113.

*Horridipamera bergrothi* Harrington, 1980, p. 99.

*Diagnosis.* Robust, heavy bodied. Dorsal surface including hemelytra and appendages thickly clothed with elongate upstanding hairs. Elongate hairs intermixed with decumbent, silvery, somewhat tomentose, pubescence. Head, pronotum and scutellum uniformly dark chocolate brown, scutellum lacking oblique light vittae. Hemelytra chiefly dark brown (similar to *nietneri*). Clavus either completely dark or with anterior half of cubital vein pale. Corium with explanate margin chiefly pale but this area invaded by a dark brown macula at level of distal end of claval commissure and at distal end of corium. Subdistal “white macula” often reduced to two or even three distinct spots. Corium frequently with a pale area on anterior half, but this not reaching claval suture. Membrane dark with pale veins and an apical median vitta. Antennae brown; fourth segment lacking a pale basal annulus; first segment often pale on distal half. Fore femora dark. Middle and hind femora with distal halves dark brown, strongly contrasting with pale proximal halves. Second labial segment pale.

Anterior pronotal lobe strongly globose, broader than width of head across eyes. Labium reaching nearly to mesocoxae.

Bulb of sperm reservoir subquadrate, not narrowing distally. Reservoir wings as in *nietneri*. Distal vesical process long slender non-serrated (Fig. 8). Proximal vesical process with a serrated crescent-shaped proximal portion (similar to that of *nietneri*) and an additional slender distally twisting portion (Fig. 5). Conjunctival spines short, broad, nonbifid and trianguloid (Figs. 24, 25). Paramere with a very large inner distally bifid flange; outer projection broad and rounded (Fig. 34).

This large dark species is readily recognizable from other African members of the genus by the numerous upright hemelytral hairs. The chiefly dark hemelytral surface is also distinctive. There is some variation in color. For example, the second and third antennal segments may be dull yellow. Occasionally the fourth segment is paler than the distal end of the third, but there is never a pale proximal annulus.

*H. bergrothi* is in general habitus and color as well as many morphological features more closely related to the Oriental *nietneri* than to any of the African species.

*Distribution.* Reported by Slater (1964a) from Cameroon, Ethiopia and Ghana; by Scudder (1969) from Guinea; by Scudder (1982) from Senegal; by Linnavuori (1978) from Sudan and as “nr *bergrothi*” by Slater (1972) from Zaire. It probably is distributed throughout tropical Africa.



*Material examined.* IVORY COAST: 1, Lamto (Toumodi), 30.i.1962. 2, same, 17.iii.1964. 1, same, 22.v.1964. 3, same, 20.ii.1962. 1, same, 11.ii.1964. 1, same, 18.ii.1964. 1, same, 6.iii.1962. GHANA: 1, Tafo, 7.x.1967 (SSS). 1, Tafo, 21.vi.1965 (Leston). 1, same, 2.ii.1966. 1, same, 8.iii.1966. 1, Sunyani, 12.xii.1965 (Leston). 1, same, 13.xii.1965. 1, Legon, 28.viii.1968 (Leston). 1, same, 30.ix.1968. 1, same, 1.x.1968. 1, Techiman, 9.xii.1965 (Leston). 1, Tokos, 6.xi.1967 (Leston). NIGERIA: 2, Umuahi CRIN, EC State, 9.iv.1975 (Medler). 1, Ile-Ife, 11.viii.1969. 1, same, 27.iii.1969. 1, same, W State, 9.iii.1975. TANZANIA: Ilonga, 29.ix.1963 (Robertson). 2, same, 3.x.1963. 2, same, 14.iv.1965. 1, same, 10.ii.1965. 1, same, 2.ii.1964. UGANDA: 1, Kasseke Busoyfora, 5.v.1940 (Stephenson).

*Horridipamera robusta* Malipatil

*Horridipamera robusta* Malipatil, 1978a, p. 92.

*Diagnosis.* A large dark strongly hirsute species. Coloration much as in *nietneri*. Fore femora completely black. Antennae brown, contrasting with velvety black coloration of head and pronotum. Fourth antennal segment with a prominent sub-basal pale annulus. Anterior pronotal lobe very large and swollen (twice as long as posterior lobe in males, 1½ times as long in females). Fore tibia armed with a large spine near middle and 2 or 3 smaller spines distally.

Malipatil (1978a) gives a good detailed description and figures of anatomical details, including those of the male genitalia.

*Immature stages.* Malipatil (1978b) has described the 4th and 5th instar nymphs and the egg.

The 5th instar nymph is said to be separable from that of *nietneri* by having the anterior pronotal lobe about 4 times as long as the posterior lobe. In *nietneri* the anterior lobe is approximately 3 times as long as the posterior.

*Egg.* The egg of *robusta* is said by Malipatil (*ibid.*) to have 4–6 chorionic processes, and average length of 1.23 and an average width of 0.36.

*Distribution.* Originally described from Queensland and northern New South Wales in Australia and from North Island, New Zealand. Malipatil (1978a) notes that it is sympatric with *nietneri* in southeastern Queensland.

*Horridipamera emersoni* (Distant), **New Status**

*Pamera emersoni* Distant, 1909, p. 491.

*Pachybrachius nietneri* Scudder, (*nec* Dohrn), 1962b, p. 770 (part).

*Horridipamera nietneri* Slater, (*nec* Dohrn), 1979, p. 22 (part).

*Diagnosis.* Elongate, slender, parallel-sided. Head, pronotum, scutellum, antennal segments I, II, III, and distal ½ of IV black. Humeral pronotal angles pale yellow. Basal half of fourth antennal segment with a broad white annulus. Hemelytra with much of clavus and inner portion of corium heavily infuscated with dark brown giving outer portion appearance of a pale yellow stripe which blends distally with what in many other species is a distinct subapical pale macula. Apex of corium and apical corial margin dark. Membrane chocolate brown with a broad strongly contrasting median white vitta. Second labial segment white or pale yellow. Fore femora

(except distal ends) and distal half of middle and hind femora black or dark castaneous.

Pronotum and scutellum lacking numerous upright elongate hairs, but with numerous short decumbent sericeous hairs present.

Eyes relatively large and somewhat protruding. Head broader than narrow, relatively unswollen, anterior pronotal lobe. Labium extending posteriorly onto mesosternum. Both sexes lacking a prominent spine midway along shafts of fore tibiae.

Although synonymized with *nietneri* by Scudder (1962) this is a distinct species. The male genitalia of the two species are completely different. The lack of a spine on the fore tibia of the male and the lack of elongate upstanding hairs on the hemelytra will also readily separate it from *nietneri*. In addition *nietneri* is a much heavier bodied, more robust species. While, as previously discussed, *nietneri* is quite variable in color, on Ceylon where the two species are sympatric *nietneri* has the dark areas of the corium more extensively developed, often covering most of the corium except for the explanate margin, and, of course, the subapical pale macula. In *nietneri* the head is narrower than the anterior pronotal lobe, the latter being more swollen and globose than in *emersoni*.

Bulb of sperm reservoir moderately tapering distally, distal end rounded. Reservoir wings moderately curving posteriorly (similar to *nietneri*), irregularly tapering. Distal vesical process elongate and slender, relatively straight. Proximal vesical process with a broadened serrated plate-like area (Fig. 12). Conjunctival spines large, elongate, acutely pointed, nonbifid; right spine (Fig. 27) longer than left (Fig. 26). Paramere with inner projection small but with an enormous distally bifid flange projecting from it (Fig. 30).

Scudder may have considered the white margined Pacific island populations of *nietneri* to represent *emersoni* leading him to synonymize the two.

In general body shape *emersoni* most closely resembles the African species *pullata* but the latter lacks a white annulus on the fourth antennal segment, its males have a mid fore tibial spine, the subapical pale corial spot is distinct, the eyes even more strongly protruding and the genitalia are distinctive (see discussion above).

*H. emersoni* appears to be a member of the *perlonga-pullata* group despite the absence of the fore tibial spine.

*Distribution.* Known only from Sri Lanka. Slater's (1979) series of *nietneri* was mixed. Specimens he reported as *nietneri* from "Kal. District, Morapatiya near Agalawatta" and "Rat. Dist., Bultota Pass 3000 ft." are *emersoni*.

### ***Horridipamera medleri*, new species**

Fig. 2

*Description.* Elongate, parallel-sided, with head broad and appendages elongate, slender. Body somewhat ant-mimetic. General coloration black to chocolate brown including entire head, pronotum, scutellum, antennae, fore femora (except extreme proximal and distal ends), and distal  $\frac{2}{3}$  of middle and hind femora. Hemelytra chiefly dull white but marked with dark chocolate brown as follows: an irregular band through center of clavus; a large elongate corial macula between R+M and CU at level of claval commissure; entire apical corial margin; a large apical corial macula; majority

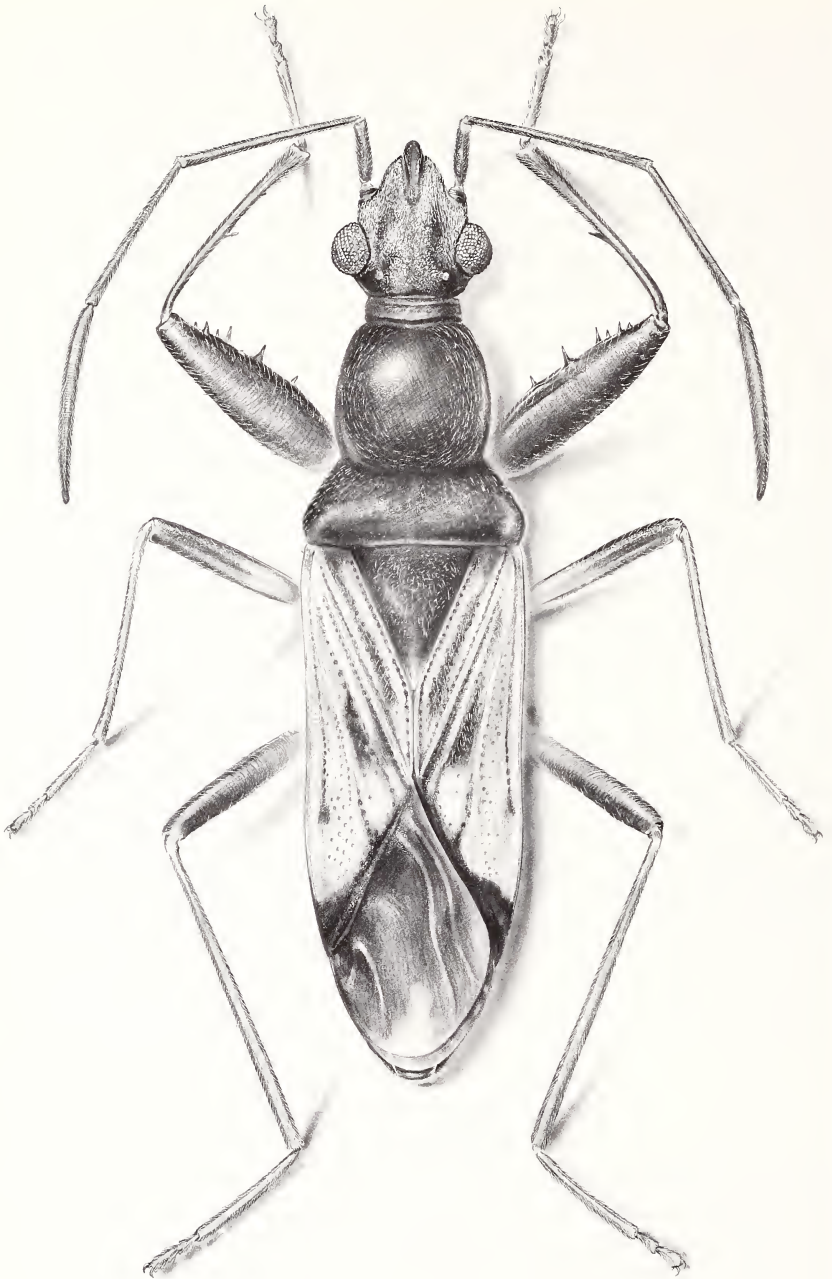


Fig. 2. *Horridipamera medleri* new species. Holotype, dorsal view.

of hemelytral punctures; membrane, except for a large apical white patch and bases of veins.

Head elongate, moderately declivent anteriorly. Tylus attaining distal  $\frac{1}{3}$  of first antennal segment. Eyes protruding. Width across head subequal to that of anterior pronotal lobe. Head considerably narrowed behind eyes, with fine, dense punctures and clothed with dense, decumbent sericeous hairs, except for a long 'S'-shaped area in front of each ocellus. Vertex moderately convex. Head length 0.92, width 1.12, interocular width 0.68, eye length 0.38, postocular distance 0.20.

Dorsal surface lacking numerous elongate upstanding hairs but clothed (including clavus and corium) with conspicuous decumbent sericeous pubescence.

Pronotum subshining. A deep transverse constriction present. Collar with distinct rows of punctures. Anterior pronotal lobe swollen, lateral margins forming a smooth evenly rounded curve. Posterior pronotal lobe with shallow, evenly separated punctures. Length anterior pronotal lobe 1.20, maximum width 1.20; length posterior lobe 0.60, width 1.48. Scutellum with a low inconspicuous median elevation. Length scutellum 0.92, width 0.84. Length claval commissure 0.56. Midline distance apex clavus–apex corium 1.20. Midline distance apex corium–apex membrane 0.88. Anterior tibiae only slightly curved proximally and each tibia with a prominent median spine. Labium extending well onto mesosternum. Length labial segments I 0.80, II 0.80, III 0.54, IV 0.42. Antennae slender, terete. Length antennal segments I 0.66, II 1.32, III 1.14, IV 0.32. Total body length 6.40.

Sperm reservoir bulb moderately narrowing distally. Reservoir wings strongly curving posteriorly and tapered (as in *perlonga*) but not produced into an elongate projection as in *inconspicua*. Vesical marginal processes more or less interconnected, elongate, twisted almost identical to conditions found in *perlonga* and *pullata*. Right conjunctival spine large, elongate and tapering to an extremely slender, acute point (Fig. 15). Left conjunctival spine with a broadened area on outer margin but not distinctly bifid and ending in a large acute spine (Fig. 14). Paramere similar to that of *perlonga* but inner flange not truncate and outer projection evident only as an evenly rounded area.

*H. medleri* most closely resembles *pullata* (Hesse). It is a relatively heavier, less slender species than is *pullata*. The anterior pronotal lobe is distinctly broader and more swollen. This is especially evident in lateral view. The corium is paler in color with the area of the corium laterad of the furrow (exocorium) either entirely white or at most with only a small, incomplete submedian dark macula. The fore femur has a large spine on the outer row proximad of the middle (lacking in *pullata*). The conjunctival spines are distinctive in shape.

*Holotype*. Male, NIGERIA: Oban RH SE State, 7.IV.1975. (J. T. Medler). In American Museum of Natural History.

*Paratypes*. 1 male, 2 females, same data as holotype. In J. A. Slater collection.

This species is named in honor of Dr. John Medler for his generosity and in recognition of his contributions to our knowledge of West African Hemiptera.

### ***Horridipamera compacta*, new species**

*Description*. Relatively stout, parallel-sided. Head, anterior pronotal lobe and scutellum black. Posterior pronotal lobe, except for a yellow spot before each humeral





Figs. 3-13. *Horridipamera* spp. 3. *H. inconspicua*, apex of proximal vesical process. 4. *H. compacta*, apex of proximal vesical process. 5. *H. bergrothi*, proximal vesical process, dorsal view, right side. 6. *H. perlonga*, phallus, showing sperm reservoir conjunctival spines and vesical processes. 7. *H. inconspicua*, phallus, semilateral view, showing sperm reservoir and proximal portion of ejaculatory duct. 8. *H. bergrothi*, distal vesical process. 9. *H. nietneri*, proximal vesical process. Dorsal view, right side. 10. *H. perlonga*, vesical process. 11. *H. compacta*, vesical processes. 12. *H. emersoni*, proximal vesical process. 13. *H. inconspicua*, vesical process.

angle, castaneous. Hemelytra variegated, pale yellow and dark red brown. Dark coloration as follows: a complete but irregular transverse vitta across middle of hemelytra which broadly attains lateral corial margins; a large apical macula; streaks on distal portion of clavus; and membrane with exception of paler veins. All hem-

elytral punctures dark brown. Antennae chiefly ochraceous to very light brown. Base of segment I, distal ends of segments II and III and apical half of segment IV dark. Fourth segment with a prominent pale annulus. Fore femora castaneous with pale distal ends. Middle femora pale with a series of brown spots distally. Hind femora pale with a conspicuous dark annulus on distal  $\frac{1}{3}$ . Head, pronotum and scutellum (but not hemelytra) thickly clothed with elongate upstanding hairs.

Head shining, moderately declivent anteriorly with dense, fine, shallow punctures. Tylus reaching to distal  $\frac{1}{3}$  of first antennal segment. Vertex only moderately convex. Eyes not strongly produced. Head length 1.08, width 1.12, interocular width 0.64, eye length 0.33, postocular length 0.19.

Pronotum subshining. Anterior lobe strongly swollen. Length pronotum 0.94, width 1.34; length posterior lobe 0.68, width 1.68. Collar with deep, irregularly arranged, punctures. Scutellar length 1.0, width 0.50. Length claval commissure 0.60. Midline distance apex clavus-apex corium 1.18. Midline distance apex corium-apex membrane 0.80. Fore femora strongly swollen, width fore femur 0.64. Front tibiae distinctly curved without a prominent spine near middle of shaft. Labium attaining middle of mesosternum, first segment remote from base of head. Length labial segments I 0.84, II 0.84, III 0.50, IV 0.44. Length antennal segments I 0.52, II 1.18, III 1.06, IV 1.20. Total body length 6.40.

Sperm reservoir bulb distinctly tapering (similar to that of *inconspicua*). Reservoir wings relatively little curved posteriorly, projecting strongly laterad, distal margin strongly convex, proximal margin nearly straight, ending in a nipple-like end.

*H. compacta* is a relatively stout species that most closely resembles *perlonga* in general habitus. It differs from *perlonga* and related species by the numerous elongate hairs on the pronotum and scutellum. The absence of a median spine on the fore tibia of the male suggests relationship with *emersoni* (as shown in Fig. 1), but this could be the result of independent loss. The male genitalia are distinctive. The widely separated vesical proximal and distal marginal processes (Fig. 11) will immediately distinguish *compacta* from either *inconspicua* or *perlonga*. The strongly swollen fore femora and pale antennae with the darkened distal ends of segments 2 and 3 are also useful recognition features.

*Holotype*. Male, INDIA (South), Shevaroy Hills, Yercaud 4,500 ft, 9.XII.1954 (P. S. Nathan). In American Museum of Natural History.

*Paratypes*. 1 female, INDIA (South), Annamalai Hills, Cinchona, 3,500 ft, X.1955 (P. S. Nathan). 1 female, Annamalai Hills, Cinchona, X.1955 (P. S. Nathan). In J. A. Slater collection.

#### *Incertae sedis*

##### *Horridipamera subsericea* (Breddin)

*Pamera* (*Entisberus*) *subsericea* Breddin, 1907, p. 205.

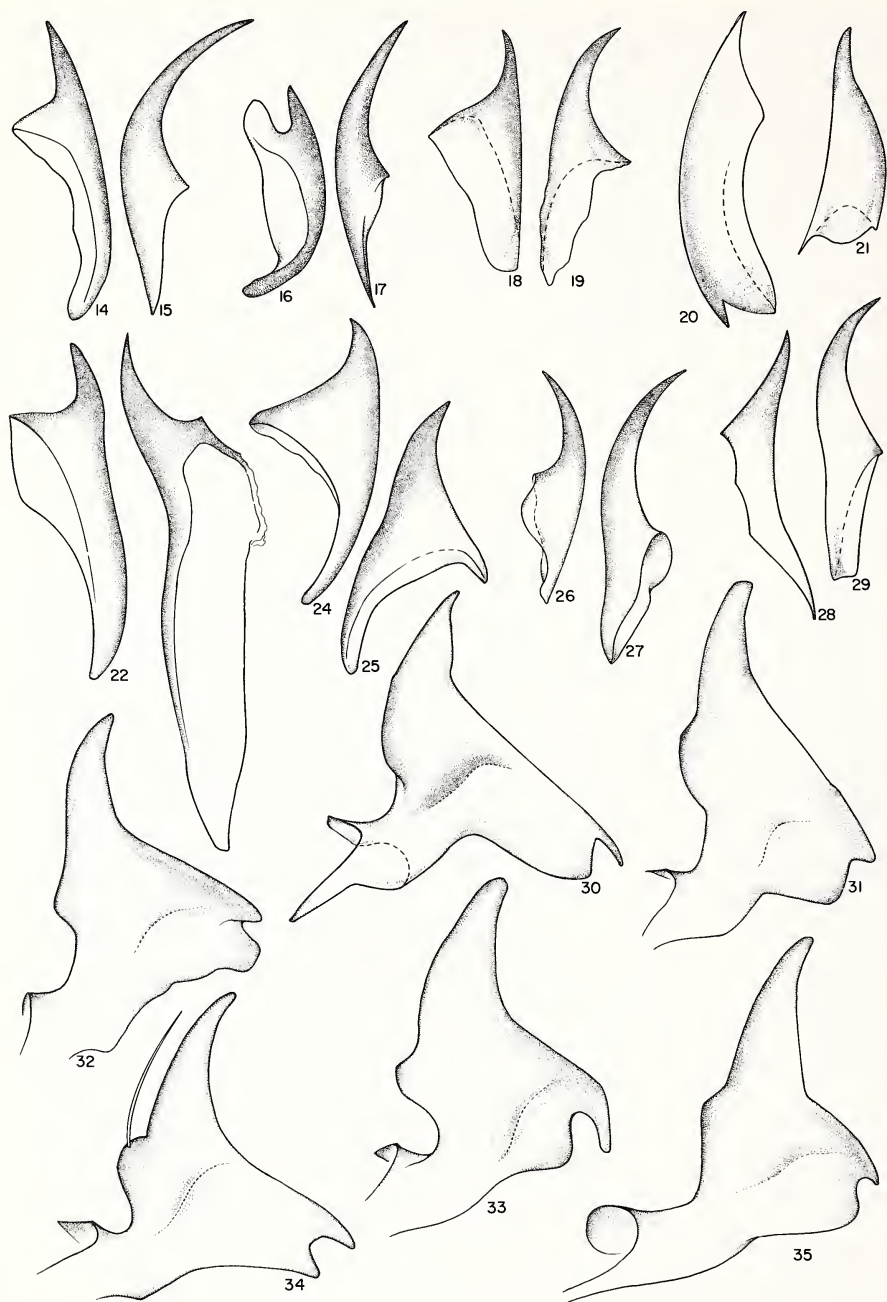
*Entisberus subsericea* Distant, 1910, p. 59.

*Pamera subsericea* Bergroth, 1918, p. 105.

*Pachybrachius subsericea* Slater, 1964a, p. 1142.

*Horridipamera subsericea* Harrington, 1980, p. 99.

This species was originally described from Ceylon and has had a checkered no-



Figs. 14–35. *Horridipamera* spp. 14. *H. medleri*, left conjunctival spine. 15. *H. medleri*, right conjunctival spine. 16. *H. pullata*, left conjunctival spine. 17. *H. pullata*, right conjunctival

menclatural history (see Slater, 1964a). Harrington (1980) placed it in *Horridipamera* but with an indication that she had not seen material and was unsure of its correct generic position.

We do not believe it will prove to be a species of *Horridipamera*. The body length of "3½ mm" is very much less than that of any known species of the genus. In fact, of the species placed in the old "omnibus" genus *Pamera* (later *Pachybrachius*), the description would seem to better "fit" *Pseudopachybrachius guttus* than any species of *Horridipamera*.

*Plociomerus undulatus* Dohrn

*Plociomerus undulatus* Dohrn, 1860, p. 404.

We have examined the type which is in Institute Zoology, Polish Academy of Sciences, Warsaw, Poland. It consists of a scutellum, meso- and metapleuron, one hind leg and one middle leg. It is not *Pseudopachybrachius gutta* as had been stated by Zheng and Slater (1984) but is a larger species of myodochine. It probably is a species of *Horridipamera* or *Paraecusmetus* but it is impossible to know what species it is. The hind leg has the femur darkened distally but not with so sharp a contrast as have several species of both genera.

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spine. 18. *H. compacta*, left conjunctival spine. 19. *H. compacta*, right conjunctival spine. 20. *H. perlonga*, left conjunctival spine. 21. *H. perlonga*, right conjunctival spine. 22. *H. nietneri*, left conjunctival spine. 23. *H. nietneri*, right conjunctival spine. 24. *H. bergrothi*, left conjunctival spine. 25. *H. bergrothi*, right conjunctival spine. 26. *H. emersoni*, left conjunctival spine. 27. *H. emersoni*, right conjunctival spine. 28. *H. inconspicua*, left conjunctival spine. 29. *H. inconspicua*, right conjunctival spine. 30. *H. emersoni*, paramere. 31. *H. compacta*, paramere. 32. *H. perlonga*, paramere. 33. *H. nietneri*, paramere. 34. *H. bergrothi*, paramere. 35. *H. inconspicua*, paramere.



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